PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN AND RELATING TO LOAD-SUPPORTING MEANS

(71) We, POWDER COUPLINGS LIMITED, a British Company, of Airedale Works, Hunslet Road, Leeds, 10, Yorkshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to means for supporting a load where the load is subject to vibrational or small translational movement.

According to the present invention, there is provided a vibration damping load support including a container having an opening and containing a vibration-damping fluid mass of metal shot and a member located at least partly within the container in contact with said mass, said member being movable, in a tilting mode or in a direction transversely of said opening.

Some forms of load support in accordance with the invention will now be described with reference to the accompanying drawings in which:—

Figures 1 and 1*a* are cross-sections through an anti-vibration pad shown in two operational positions;

Figure 2 is a cross-section through a modified form of anti-vibration pad; and

Figures 3 and 4 are cross-sections through a bridge bearing shown in two operational positions.

The load support of Figures 1 and 2 is an anti-vibration pad, in particular for supporting a vibrating machine such as a reciprocating engine. The pad comprises an upright cylindrical container or drum 11 having an upward-facing opening in which is a piston 12. The clearance between the piston and the surrounding wall of the container is sufficient to permit tilting of the axis of the piston relative to the axis of the container, a resilient sealing ring 13 extending across this clearance to close off the space beneath the piston. This space beneath the piston is filled with a vibration-damping fluid mass of particles 14, in particular metal shot, sufficiently large to prevent it from entering or jamming between the piston and surrounding part of the cylinder. This shot supports the piston above the base of the cylinder but, having fluid properties, prevents the transmission of at least part of the vibration from the piston to the cylinder. The container is mounted on a fixed support, and the piston is connected to the machine to be supported.

It will be evident that the arrangement shown in Figure 1 could be inverted so that the load is connected directly to the cylinder and is supported, through the shot, on the piston.

In the variation of Figure 2, a barbed or inverted fir-tree-shaped member 15 projects from a piston 12′ into the shot so that the latter is displaced on upward movement of the piston, and the piston is also partially supported by a coil spring 16 on the base of the cylinder 11. The pad in other respects can be as in Figure 1 although, in the arrangement shown in Figure 2, the seal is in the form of a sealing diaphragm 13′ extending between the wall of the cylinder and a piston rod 17 extending above the piston.

Figure 3 shows a bearing for supporting part of a bridge yet permitting it to move horizontally, for example due to longitudinal expansion. In this case the lower part of the support is a drum or other container 20 in which is a vibration-damping fluid mass of particles 14, in particular a bed of metal shot, and the upper part of the support is formed by a member 21 attached to or integral with the bridge, the under surface of the member being profiled, in particular by having a downward bulge located transverse to the length of the bridge. This bulge projects into the shot filling within the container and upon movement of the bridge in the direction of its length, the shot is displaced without substantially varying the support which the shot affords to the superimposed part of the bridge.

WHAT WE CLAIM IS:—

1. A vibration damping load support including a container having an opening and containing a vibration-damping fluid mass of metal

shot and a member located at least partly within the container in contact with said mass, said member being movable, in a tilting mode or in a direction transversely of said opening.

2. A vibration-damping load support according to claim 1 wherein said member is a piston.

3. A vibration-damping load support according to claim 1 or claim 2 wherein said member is connected to a barb-supporting element which projects into the mass of particles.

4. A vibration-damping load support according to any preceding claim further comprising a spring biassing said member in an upward direction.

5. A vibration-damping load support according to claim 1 wherein said member rests on the upper surface of said mass and is movable transversely of the opening of the container but is profiled on its face directed inwardly of the container to project into the mass of particles.

6. A vibration-damping load support, according to any preceding claim having sealing means extending between said member and the adjacent parts of the container.

7. A vibration-damping load support, according to any preceding claim, forming part of the mounting of a bridge.

8. A vibration-damping load support substantially as herein described with reference to the accompanying drawings.

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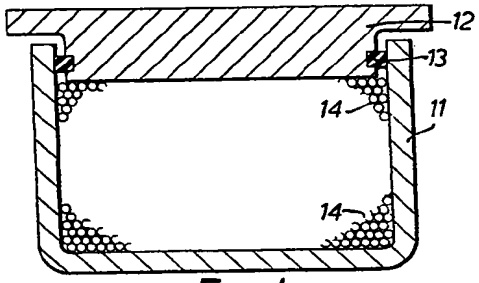

FIG. 1.

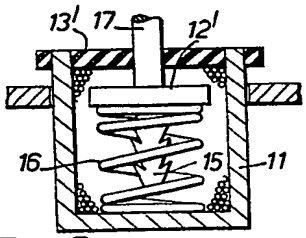

FIG. 2.

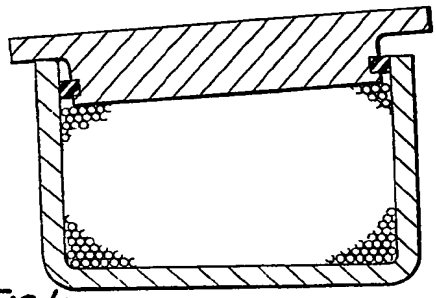

FIG. 1a.

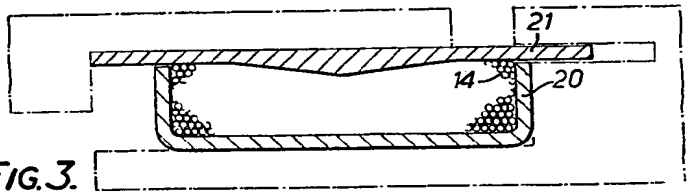

FIG. 3.

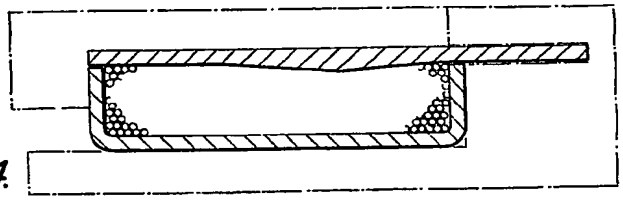

FIG. 4.

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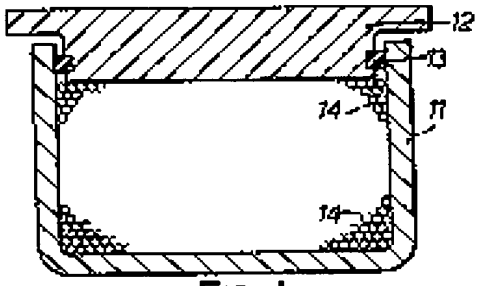

FIG. 1.

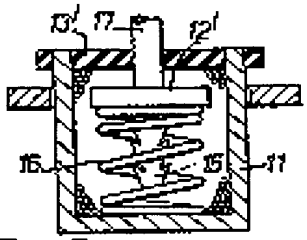

FIG. 2.

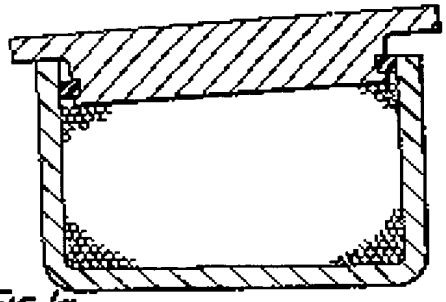
FIG. 1a.

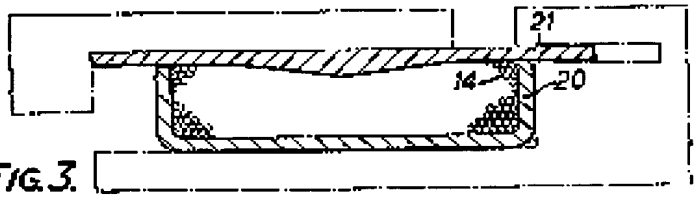

FIG. 3.

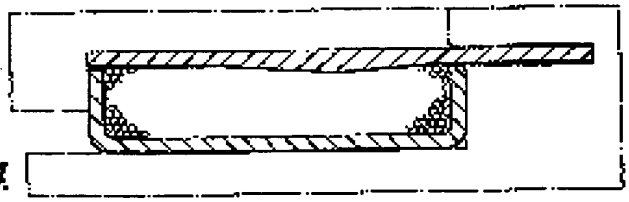
FIG. 4.